Experimental Astronomy 2015 vol.39 N3, pages 595-604

Double-wedged Wollaston-type polarimeter design and integration to RTT150-TFOSC; initial tests, calibration, and characteristics

Helhel S., Khamitov I., Kahya G., Bayar C., Kaynar S., Gumerov R.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2015, Springer Science+Business Media Dordrecht. Photometric and spectroscopic observation capabilities of 1.5-m Russian–Turkish Telescope RTT150 has been broadened with the integration of presented polarimeter. The well-known double-wedged Wollaston-type dual-beam technique was preferred and applied to design and produce it. The designed polarimeter was integrated into the telescope detector TFOSC, and called TFOSC-WP. Its capabilities and limitations were attempted to be determined by a number of observation sets. Non-polarized and strongly polarized stars were observed to determine its limitations as well as its linearity. An instrumental intrinsic polarization was determined for the 1 × 5 arcmin field of view in equatorial coordinate system, the systematic error of polarization degree as 0.2 %, and position angle as 1.9∘. These limitations and capabilities are denoted as good enough to satisfy telescopes' present and future astrophysical space missions related to GAIA and SRG projects.

http://dx.doi.org/10.1007/s10686-015-9468-8

Keywords

Imaging polarimetry, Polarimeter, RTT150, TFOSC-WP, TUG, WeDoWo